

***Berberis sanei* Husain et al. (*Berberidaceae*),
a new species from Arunachal Pradesh, India**

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Summary : A new species of *Berberis* L. from Arunachal Pradesh, India, is described based on herbarium as well as micromorphological studies through SEM.

Résumé : Description d'une nouvelle espèce de *Berberis* L. originaire de l'Inde (Arunachal Pradesh), confirmée par des études micromorphologiques (M.E.B.).

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During the course of a monographic study on the genus *Berberis* L. in India the authors detected an interesting specimen (*Mehrotra & Party* 2439, LWG) wrongly labelled as *Berberis insignis* Hook. f. & Thoms. var. *shergaonensis* Ahrendt. Further, critical studies including the micromorphological characters of leaf epidermis and pollen clearly established that this is a new species closely allied to *B. dasyclada* Ahrendt, and the same is diagnosed and described here.

***Berberis sanei* Husain, Datt, Garg & R. R. Rao, sp. nov. — Fig. 1.**

Proxima similis B. dasyclada Ahrendt, *sed ab ea foliis supra manifeste albo-pruinosis, spinis rigidis, 3-fidis, inflorescentiis usque ad 13-floris, pedicellisque 13-15 mm longis differt.*

TYPE : *Mehrotra & Party* 2439, India, Arunachal Pradesh, Bomdila, Palit Hills, ca. 3300 m, 5 May 1970, fl. (holo-, LWG ; iso-, CDRI).

Habitat unknown (erect shrub ?). Stems yellow or yellow brown, often with warty hairs ; spines 3-fid, 1.7-2.3 cm long, stout. Leaves 8-12.5 × 2.5-4.2 cm, elliptic to obovate-elliptic, apex ending into a spine, base tapering, above distinctly white pruinose, dull, shining below, margins 13-18 spinose ; spines 1-1.5 mm long, up to 6 mm distant ; petioles 2-3 mm long.

Inflorescence fascicled, up to 13-flowered. Flowers yellow ; pedicels 13-15 mm long. Outer sepals 4-5 × 3-3.5 mm, obovate, obtuse, veins not distinct ; median and inner sepals 6-7 × 5-6 mm, obovate, obtuse. Petals 4.5-5 × 3-3.5 mm, obovate, obtuse, entire ; glands on petals 1.5-1.75 mm long, lanceolate. Anthers 1 mm long ; connective apiculate ; filaments 2 mm long. Ovary shortly stylose ; ovules 4-5.

Berries not seen.

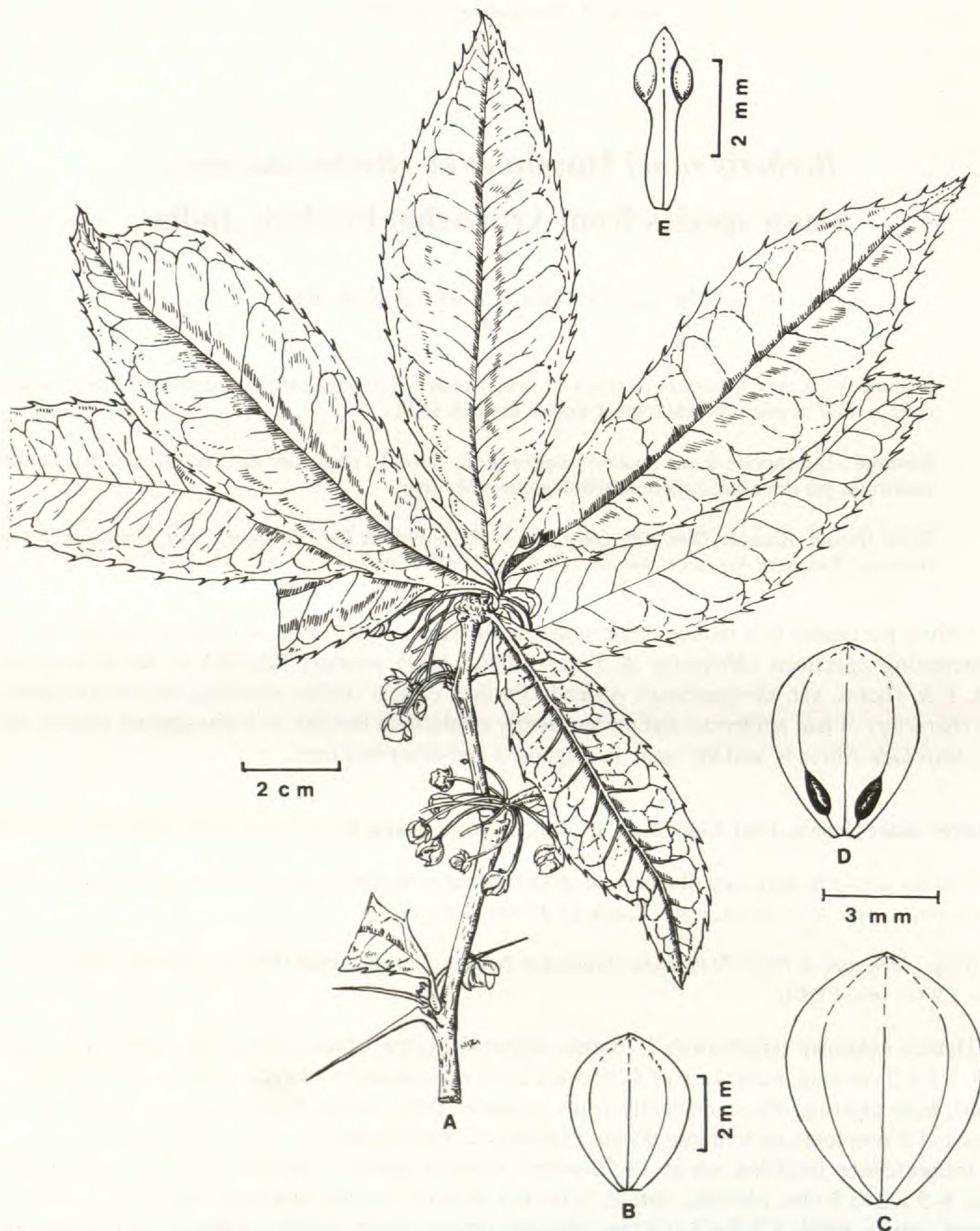


Fig. 1. — *Berberis sanei* Husain, Datt, Garg & R. R. Rao : A, habit ; B, outer sepal ; C, inner sepal ; D, petal with glands ; E, stamen. — Mehrotra & Party 2439 (LWG).

The new species is closely allied to *Berberis dasyclada* Ahrendt and to *B. insignis* Hook. f. & Thoms. of the subsection *Insignis* Schneid. A key to distinguish all Indian species of the subsection is provided below.

The specific epithet is coined after Dr. P. V. SANE, a distinguished botanist and Director, NBRI, Lucknow.

KEY TO INDIAN SPECIES OF *BERBERIS* OF THE SUBSECTION *INSIGNIS*

1. Stems pubescent ; anthers apiculate.
 2. Stems yellow or yellow- brown ; spines 3-fid, rigid ; leaves distinctly white pruinose above, dull ; leaf serrations 1–1.5 mm long ; inflorescence up to 13-flowered ; pedicels 13–15 mm long *B. sanei*
 - 2'. Stems dark red ; usually without spines ; leaves nitid above, leaf serrations 2–3 mm long ; inflorescence usually up to 6-flowered ; pedicels 6–12 mm long *B. dasyclada*
- 1'. Stems glabrous ; anthers obtuse or truncate.
 3. Petals emarginate ; ovules 4 *B. insignis*
 - 3'. Petals entire ; ovules 5–7 *B. incrassata*

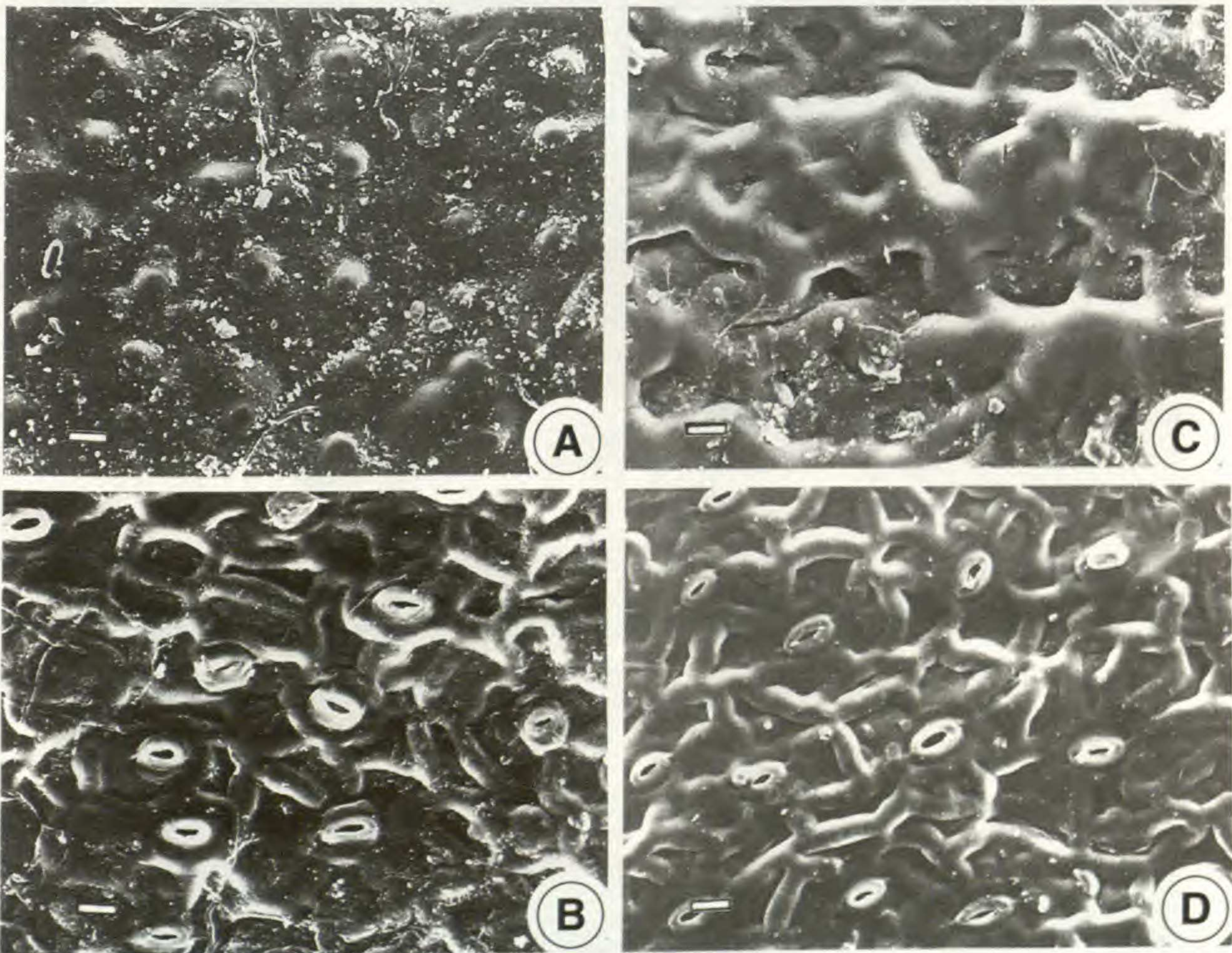


Fig. 2. — SEM of leaf epidermis of *Berberis sanei* Husain, Datt, Garg & R. R. Rao : A, adaxial surface ; B, abaxial surface (Mehrotra & Party 2439, LWG). — *B. dasyclada* Ahrendt : C, adaxial surface ; D, abaxial surface (Kingdon-Ward 13700, BM). Bar = 10 μ m.

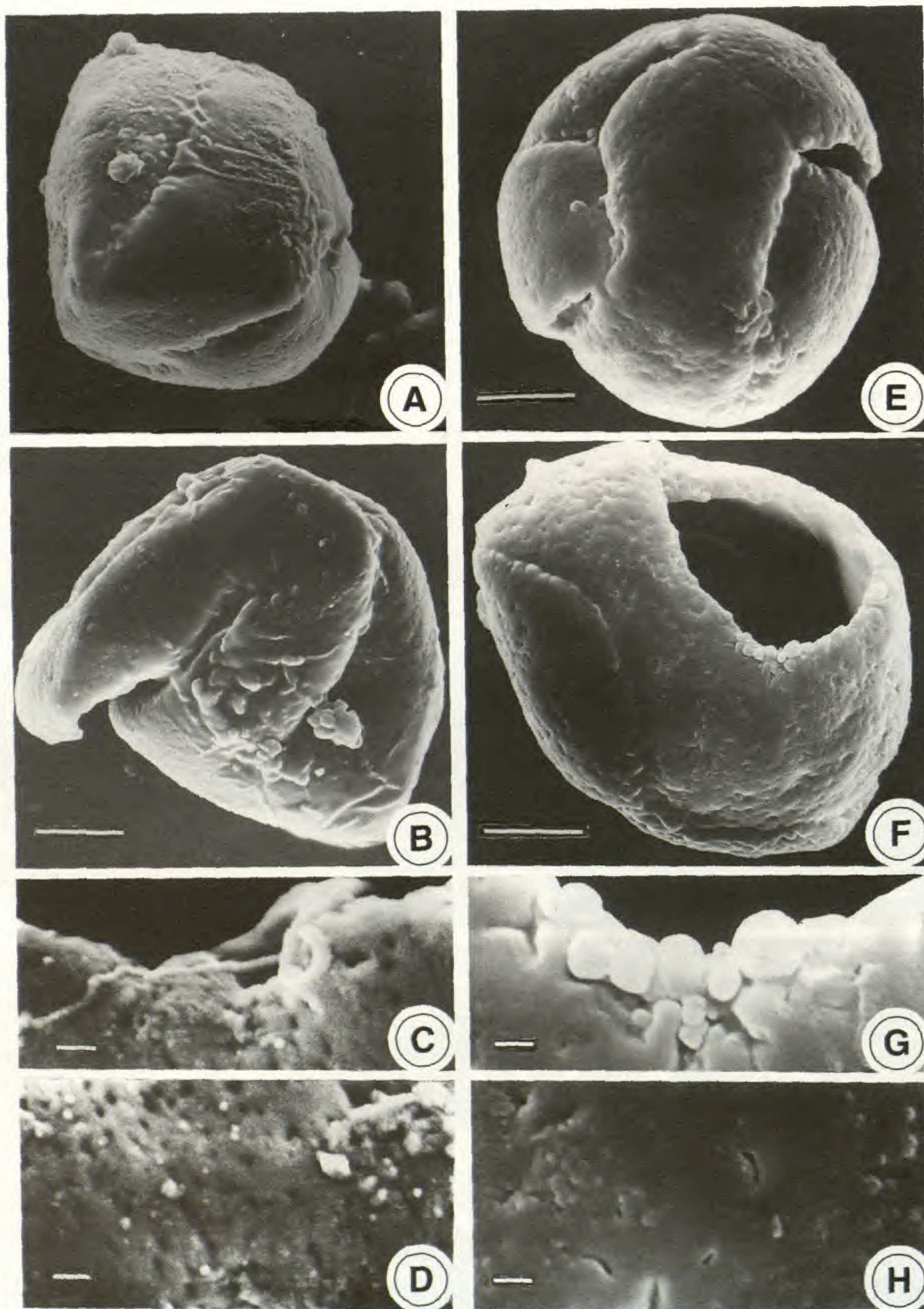


Fig. 3. — SEM of pollen of *Berberis sanei* Husain, Datt, Garg & R. R. Rao : A, equatorial view ; B, surface view ; C, apertural margin ; D, reticulo-areolate surface (*Mehrotra & Party* 2439, LWG). — *B. dasyclada* Ahrendt : E, equatorial view ; F, surface view ; G, apertural margin ; H, distantly punctate surface (*Kingdon-Ward* 13700, BM). Bar \approx 10 μ m for A, B, E, F ; 1 μ m for D, G, H ; 0.1 μ m for C.

MICROMORPHOLOGICAL STUDIES

Additional evidences supporting *B. sanei* as new species was obtained through leaf epidermal and palynological studies.

LEAF EPIDERMIS. — In *B. sanei*, the upper epidermis is papillose with convex periclinal cell walls and inconspicuous cell boundaries. In *B. dasyclada*, the periclinal cell walls on the upper epidermis are concave with prominent cell boundaries and without papillae. The arrangement of stomata on the lower epidermis also varies in two species, the former with partly clustered stomata and the latter with stomata uniformly scattered (Fig. 2).

POLLEN MORPHOLOGY. — Pollen morphological characters have been tabulated below (Fig. 3).

| <i>B. sanei</i> | <i>B. dasyclada</i> |
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| <p>Aperture type Basically 3-colpate, colpi long, sometimes adjacent or opposite colpi unite (syncolporization) forming a semispiral winding in “ U ” fashion.</p> <p>Margin smooth. Membrane smooth.</p> <p>Tips not well defined.</p> <p>Surface Finely reticulo-areolate (with negative reticulum ; OL pattern) having fine holes, muri of varying shapes and sizes (round- elongated) at places transverse thread like deposition of sporopollenin are present.</p> <p>Exine thickness 2.2 μm thick, endoexine twice thicker than ectoexine.</p> <p>Columella indistinct.</p> <p>Shape and size Subspheroidal (prolate-spheroidal) 67 \times 61 μm (range 65–69 \times 56–65 μm). AMB circular angulate. Grains tectate, tectum perforate.</p> | <p>Spiraperturate, spiral coils in various directions and turn transversely to divide the surface into cross-strips. Sometimes one colpus may be free while other-2 united.</p> <p>Margin coarse. Membrane granulate, granules heterogenous (of varying sizes). Tips rounded.</p> <p>Rough, uneven, distantly punctate (having elongated perforations).</p> <p>Exine of varying thickness 3 μm with ectoexine thicker than endoexine, to 2.2 μm where ectoexine = endoexine. Columella faint.</p> <p>Subspheroidal 56 \times 52 μm (range 54–60 \times 50–54 μm). AMB circular oval. Grains tectate, tectum distinctly punctate.</p> |

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